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WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE. II. 'MASTICHODENDRO--ETC(U)
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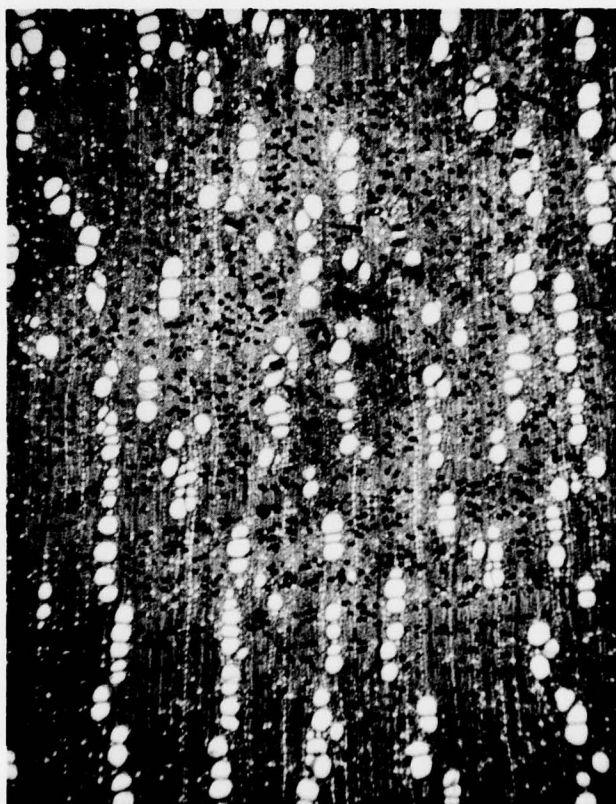
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**WOOD ANATOMY
OF THE
NEOTROPICAL SAPOTACEAE
II. MASTICHODENDRON**

RESEARCH PAPER FPL 326

FOREST PRODUCTS LABORATORY
FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE
MADISON, WIS.
1978



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Preface

The Sapotaceae form an important part of the ecosystem in the neotropics; for example, limited inventories made in the Amazon Basin indicate that this family makes up about 25% of the standing timber volume there. This would represent an astronomical volume of timber but at present only a very small fraction is being utilized. Obviously, better information would help utilization--especially if that information can result in clear identification of species.

The Sapotaceae represent a well-marked and natural family but the homogeneous nature of their floral characters makes generic identification extremely difficult. This in turn is responsible for the extensive synonymy.

Baehni and Bernardi (3) state the situation with respect to Peru but this would hold equally well for all of the neotropics: "For instance, of the 39 species and one variety described hereunder, 13 are known only from the Peruvian type; and 23 taxa here presented have no fruit or seed. It is universally admitted that the taxonomy of this family is almost impossible without--for the same species--leaves, flowers, fruits, and seeds."

Unfortunately, species continue to be named on the basis of flowering or fruiting material alone and this continues to add to the already confused state of affairs.

This paper on Mastichodendron is the second in a series describing the anatomy of the secondary xylem. The first was on Bumelia and is listed in the literature cited at the end of this paper. Others will follow in the same pattern.

Publication in this manner will afford interested anatomists and taxonomists the time to make known their opinions and all such information is hereby solicited. At the termination of this series the data will be assembled into a single comprehensive unit.

6 WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE

II. MASTICHODENDRON

By

10 B. F. Kukachka^{1/} Botanist^{1/}

Forest Products Laboratory, Forest Service
U.S. Department of Agriculture

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Abstract

The genus Mastichodendron as established by Cronquist consists of a small group of closely related species native to southern Florida, the West Indies, and Central America. The hard, heavy, fine-textured woods typically have a yellowish cast. Anatomically they are characterized by reticulate-diffuse parenchyma and an abundance of two-sized crystals in the parenchyma and wood rays. Silica is lacking.

Introduction

For many years a number of American Sapotaceae were referred to the genus Sideroxylon. In 1946 Cronquist (4) described Mastichodendron as a new genus segregated from Sideroxylon and established five species and varieties native to southern Florida, the West Indies, and Central America.

What would appear to be the sixth species, Mastichodendron williamsii (Baehni) Baehni ex Bernardi (3) based on Williams 3198 from Peru, is actually a species of Micropholis. This species is known only from the type locality and the description is based on leaves and young flowers; the fruit and seed is unknown. The description in "Flora of Peru" (3) suggests Micropholis to this author and this opinion is verified by the wood anatomy of the available wood specimen (Williams 3198).

Baehni (2) adopted Mastichodendron as a segregate from Sideroxylon but included species from Africa and southeast Asia. He also placed

^{1/} Pioneering Research Unit, FPL. The Laboratory is maintained at Madison, Wis. in cooperation with the University of Wisconsin, Madison.

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Mastichodendron capiri (A.DC.) Cronquist in synonymy under Paralabatia capiri (A.DC.) Baehni. Anatomically these two genera are very different and, in this author's opinion, the transfer is not justified.

Aubréville (1) also adopted Mastichodendron but included only the American species, which is in accord with the treatment by Cronquist. In Aubréville's treatments, the genus Sideroxylon is limited to Africa.

Record (6) provided a brief anatomical description of three American species under the genus Sideroxylon which are now considered as belonging to Mastichodendron. He mentioned three additional species of Sideroxylon which differed significantly from those he had described, and referred to these as an "unnamed group." It is now known that the three species of this "unnamed group" belong to three different genera.

The genus Mastichodendron as treated by Cronquist is in complete accord with the wood anatomy as developed in this study.

Materials and Methods

Four of the five species described by Cronquist (4) were available for this study. Wood of Mastichodendron floribundum (Griseb.) Cronquist of Jamaica was not investigated. Apparently this is a rare species since Cronquist cited only the type and two additional collections in his monograph. In all, 55 wood specimens were studied with the greatest representation being in M. foetidissimum typicum, which is the type of the genus (table 1).

The methodology employed was described in the first publication of this series (5).

Description of the Wood

General: Wood lustreless with a yellowish cast, passing with age to a pale yellowish-brown. Growth rings demarcated by zones of fibrous tissue which are quite free of parenchyma. Wood hard, heavy, fine-textured. Specific gravity (range of individual specimens) from 0.68 in juvenile wood of foetidissimum typicum to 1.10 in mature wood of this species from Cuba; generic average 0.93 for 55 specimens.

Anatomical:

Typically diffuse-porous or approaching a radial alinement of the pore multiples, which is most evident in the Central American material (figs. 1-2). Pores most commonly in radial multiples

of 2-3 (4); solitary pores present but comprise only a small percentage of the total. Maximum pore diameters observed in individual specimens range from 87 μm to 102 μm in juvenile wood to 205 μm in the mature wood of Belizense. The most common maximum observed in mature wood was 158 μm .

Vessel member length averages range from 450 μm in juvenile wood of foetidissimum typicum to a maximum of 970 in one specimen of capiri tempisque. The generic average for 55 specimens was 670 μm . The longest elements occur in capiri tempisque in which the average was 780 μm .

Inter-vessel pit-pairs 4-6 μm in diameter. Perforations simple. Tyloses common in the heartwood; thin-walled. Very large two-sized crystals are found rather frequently in the tyloses of foetidissimum typicum.

Axial parenchyma diffuse and reticulate or with a hand lens showing a more or less definite uniseriate banding which is closely spaced (figs. 3-4). The latter condition is most common in the Central American specimens. Short crystalliferous strands common, consisting of the usual rhombic crystals and frequently with rhombic and very small crystals in the same cell (2-sized). Microcrystals (crystal sand) were observed in many specimens of foetidissimum typicum but were not seen in the other species examined.

Wood rays (1)2-3(4) seriate; heterocellular. Vertical fusions common. Maximum height of the 2-3 seriate portions of the rays range from 200 μm to 630 μm with an overall average of 345 μm . Vessel-ray pitting various but commonly round or ovate and larger than the inter-vessel. Rhombic and two-sized crystals frequent in all specimens and generally confined to the square or erect marginal cells. Microcrystals were observed in a few specimens of foetidissimum typicum. Organic contents sparse and generally occur in isolated cells as yellow-brown globules.

Wood fibers thick-walled; specimen averages for fiber length range from 1.09 mm in juvenile material to 2.22 in mature wood of capiri tempisque from Costa Rica. Average fiber length for all specimens was 1.59 mm. The fiber length of the Central American specimens is generally above the generic average. Vascular tracheids common in all specimens.

Diagnostic features: Wood yellowish; parenchyma reticulate-diffuse; rhombic and two-sized crystals abundant in parenchyma and wood rays; silica lacking.

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Wood anatomy of neotropical Sapotaceae:
 II. Mastichodendron, by B. F. Kukachka.
 Res. Pap. FPL 326, For. Serv., U.S. Dep. Agr.,
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Consists of a small group of closely related species native to southern Florida, West Indies, and Central America. The hard, heavy, fine-textured woods typically have a yellowish cast. Characterized by reticulate-diffuse parenchyma and an abundance of two-sized crystals in parenchyma and wood rays. Silica is lacking.

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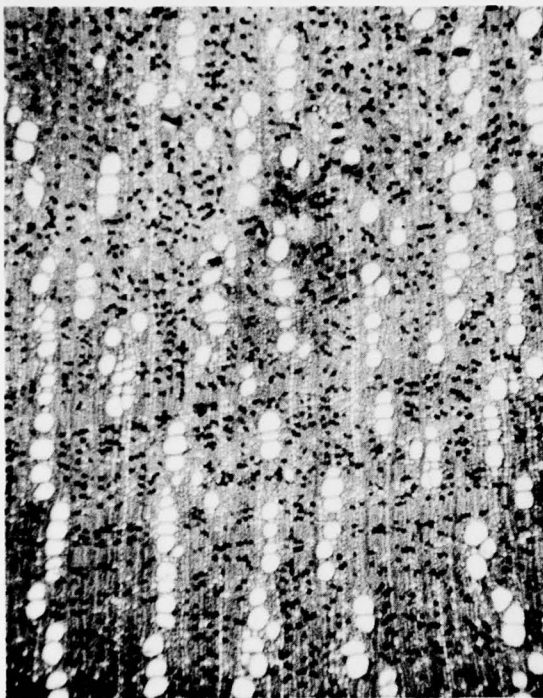


Figure 1.--M. foetidissimum typicum
(Stern-Brizicky 467) Arrangement
of pores and parenchyma X 30.

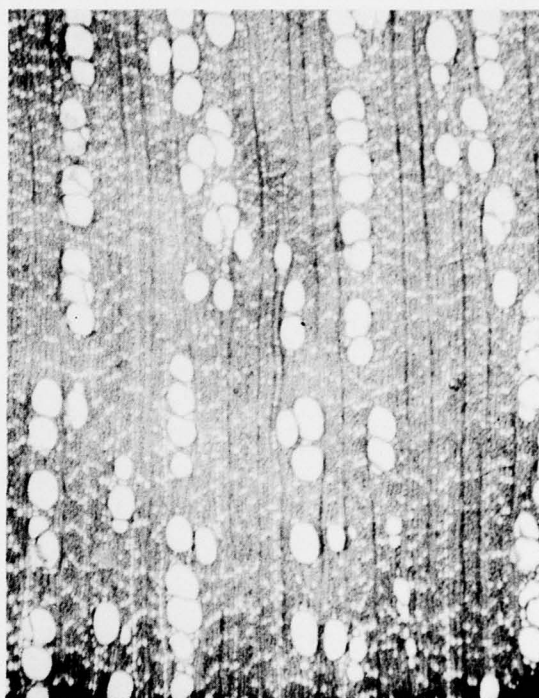


Figure 2.--M. capiri tempisque
(Kress 31) Arrangement of pores
and parenchyma X 30.

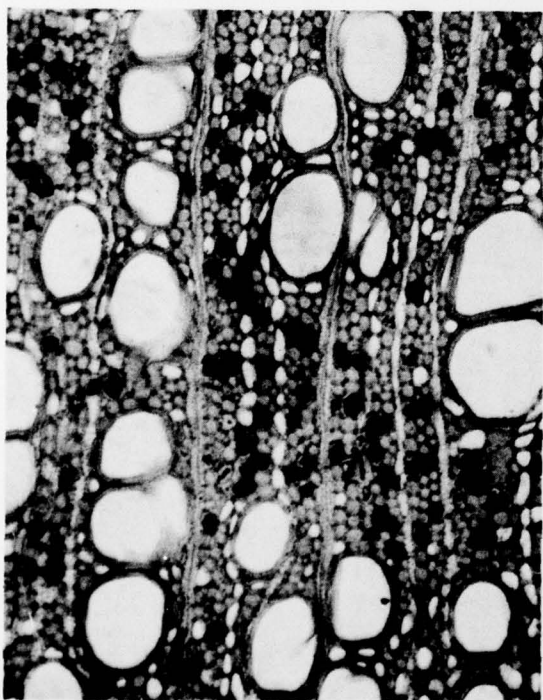


Figure 3.--M. foetidissimum typicum
(Stern-Brizicky 467) illustrating
parenchyma detail. The dark-colored
cells are crystalliferous. X 110.

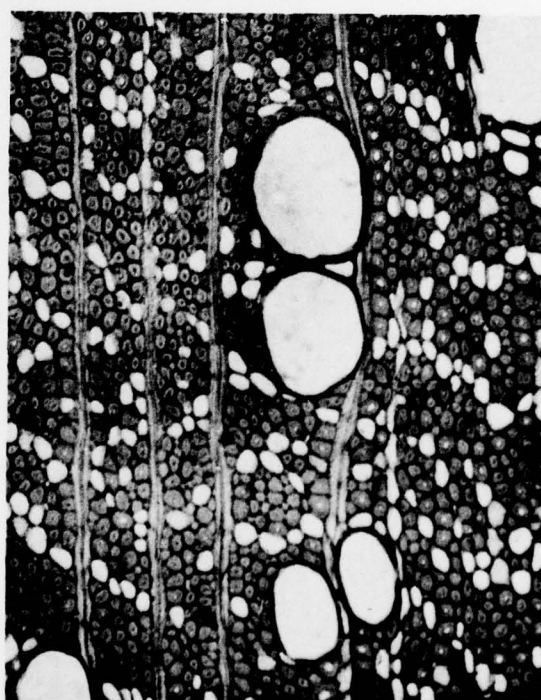


Figure 4.--M. capiri tempisque
(Kress 31) Showing parenchyma
detail. X 110.

Table 1.--Wood specimens of *Mastichodendron* examined

| Species | Collector and Number | Origin | Numbers in wood collection | |
|--|---|---|--|-------------------------|
| | | | MADw | SJRw* |
| <i>angustifolium</i> (Standl.) Cronquist | Commercial Ortega | 179 sn Salvador Mexico | 3623 | 10427 |
| <i>belizense</i> (Lundell) Cronquist | Finding | 10 Belize | | 41070 |
| <i>capiri tempisque</i> (Pittier) Cronquist | Broadway Calderon Edwards Hamilton Hottle Kress Kress Moncado Purdy Forest Service Whitford-Stadtmitter | sn sn 371 sn 27 5 31 sn 6 305 71 Trinidad Salvador Honduras Costa Rica Honduras Costa Rica Costa Rica Honduras Costa Rica Trinidad Guatemala | 20867(H) 7509 20865(H) 3579 15605 11212 12175 16175 6091** 37960 10844 3730 | |
| <i>foetidissimum gaumeri</i> (Pittier) Cronquist | Maderas Trop. Stevenson, D. Stevenson, N. S. | 25 24 117 Mexico Belize Belize | 11260 | 48091 12004 35039 |
| <i>foetidissimum typicum</i> Cronquist | Commercial Commercial Commercial Commercial Abbot Anderson Cons. For. Curran-Haman Cowles Curtiss Durland Durland Forest Service Fors Gill Graves Hodge Hutchinson Jack MacDonald Matthews-Crosby Matthews-Crosby Mell Mell Miller Miller Pittier Rhoads Scarff Schiffino Schiffino St. Louis Expo. St. Louis Expo. Stern-Brizicky Stern-Brizicky Wilson 10th Census 10th Census | 56 919 91 123 308 319 461 sn 22 80 24 9 sn sn sn sn 5530 22 7 17 sn sn 1629 1697 268 8313 5 8 37 Cuba Cuba 467 483 35 136 182 Bahamas Puerto Rico Puerto Rico Dom. Rep. Dom. Rep. Florida Jamaica Curacao Puerto Rico Florida Puerto Rico Dom. Rep. Haiti Cuba Cuba Cuba Dominica Cuba Cuba Florida Cuba Cuba Florida Puerto Rico Florida Venezuela Dom. Rep. Dom. Rep. Dom. Rep. Cuba Cuba Florida Florida Florida Florida Florida Florida | 3600 4573 7012 7066 45882 48005** 2152 47822 20442 8046 5041 19561 14410 15859 9523 5006 53170 38294 16616 32534 9164 9174 2980 2982 20856 20979 8254 9339 49052 35295 35157 35176 744 821 18269 18271 15978 5180 5182 | |

* Specimen numbers in the right column, followed by letter (H), are from the Harvard Wood Collection.

** From cultivated specimens.